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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,841	11/24/2003	Dai Huang	P2023/N9028	3614
23456 7590 06/29/2007 WADDEY & PATTERSON, P.C. 1600 DIVISION STREET, SUITE 500 NASHVILLE, TN 37203			EXAMINER DANIELS, MATTHEW J	
			ART UNIT 1732	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/720,841	<b>Applicant(s)</b> HUANG ET AL.	
	<b>Examiner</b> Matthew J. Daniels	<b>Art Unit</b> 1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 April 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 13-18 and 20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. In the reply filed 20 April 2007, Claims 1 and 19 were amended. There are no new claims and no cancelled claims.

#### *Response to Amendment*

2. The declaration filed on 20 April 2007 under 37 CFR 1.131 has been considered but is ineffective to overcome the Huang reference (USPN 6699427).
3. Firstly, MPEP 715.04(I) states that certain parties may make a declaration under 37 CFR 1.131. The parties may be (A) All inventors of the subject matter claimed, or (B) less than all named inventors where it is shown that less than all named inventors invented the subject matter of the claims under rejection. It is noted in this case that the Idea Record CP-02-01-GRSP-01 recites two inventors. Further, it is noted that laboratory notebooks have been submitted from both inventors Huang and Lewis. Thus, it appears to be implicit from the evidence submitted in support of conception and reduction to practice that more than one inventor invented the subject matter of Claims 1 and 19.
4. Secondly, the declaration recites that the invention "was conceived and reduced to practice at least as early as the effective filing date of July 26, 2002 which is relied upon for the rejections in the outstanding Office Action." (emphasis added, paragraph 10, page 3). Rule 37 CFR 1.131(b) states that the showing of facts shall be such as to establish reduction to practice "prior to the effective date of the reference". A date of conception and reduction to practice "at

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least as early as the effective filing date” of the reference is insufficient to establish prior invention under 37 CFR 1.131.

5. Thirdly, the declaration does not state that the redacted dates from the notebooks or other evidence are prior to the effective filing date of the ‘427 patent.

***Claim Rejections - 35 USC § 112***

6. Rejections set forth previously under this section are withdrawn in view of the amended claims.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b); by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. **Claims 1, 2, 6-12 and 19** are rejected under 35 U.S.C. 102(e) as being anticipated by Huang (USPN 6699427).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the

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inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

Applicant has pointed out that the assignment of the application and the Huang patent is currently the same, and the Huang patent lists the three inventors of the instant application. Applicant is directed to MPEP 2136.04, which states “‘Another’ means other than applicants, *In re Land*, 368 F.2d 866, 151 USPQ 621 (CCPA 1966), in other words, a different inventive entity. The inventive entity is different if not all inventors are the same. The fact that the application and reference have one or more inventors in common is immaterial.” Additionally, please note MPEP 706.02(b) which describes the ways in which a rejection under 35 USC 102(e) may be overcome.

**As to Claim 1**, Huang teaches a method of forming a composite material comprising: combining carbon-containing fibers (4:55-60), a carbonizable pitch matrix material (Abstract, 5:46-6:15) which is interpreted to be thermoplastic, and a friction additive to form a mixture (4:60-68);

heating the mixture to a sufficient temperature to melt a portion of the matrix material (Claim 1, column 11), the step of heating including:

applying an electric current to the mixture to generate heat within the mixture (Claim 1, column 11); and

while heating the mixture, applying a pressure of at least 35 kg/cm<sup>2</sup> to the mixture to form a compressed composite material (Claim 1, column 11).

As to Claim 2, graphitized carbon (4:65) is interpreted to be isotropic coke.

As to Claim 6, See Huang’s Claim 19, column 12.

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As to Claim 7, See Huang's Claim 2, column 11.

As to Claim 8, See Huang's Claim 4, column 11.

As to Claim 9, See Huang's Claim 8, column 12.

As to Claim 10, See Huang's Claim 9, column 12

As to Claim 11, See graphitized carbon (4:65), and Claim 13, column 12

As to Claim 12, See Claim 19, column 12

As to Claim 19, See Claim 22 and graphitized carbon (4:65), which is interpreted to be isotropic coke. Also see the abstract for disclosure of milled pitch, which is interpreted to be thermoplastic.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 2, 3, 4, and 19** are rejected under 35 U.S.C. 103(a) as being obvious over Huang (USPN 6699427) in view of Kalnins (USPN 4252513).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of

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invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Huang teaches the subject matter of Claim 1 above under 35 USC 102(e). **As to Claims 2, 3, and 4**, Kalnins also teaches that silica powder, among other substances which comprise either isotropic coke or an oxide of silicon listed in (4:35-5:10), are “commonly used friction modifiers” (4:47). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Kalnins into that of Huang in order to modify the friction characteristics or increase the stopping power or lifetime of the brake (Kalnins 2:55-56). **As to Claim 19**, in the event that graphitized carbon cannot be considered to be isotropic coke (See the rejection of Claim 19 above under 35 USC 102(e)), the Examiner submits that friction additives including at least one of an oxide would have been prima facie obvious at the time of the invention. Huang teaches substantially all of the subject matter of instant Claim 19 in Claim 22 of the ‘427 patent (columns 12-14), and Kalnins additionally teaches that silica powder, among other substances which comprise either isotropic coke or an oxide of silicon listed in (4:35-5:10), are “commonly used friction modifiers” (4:47). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to

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incorporate the method of Kalnins into that of Huang in order to modify the friction characteristics or increase the stopping power or lifetime of the brake (Kalnins 2:55-56).

9. **Claims 1-4, 7, 8, 10-12 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sodha (USPN 5057254) in view of Kalnins (USPN 4252513). **As to Claim 1**, Sodha teaches

Combining carbon-containing fibers (1:67-68) and a carbonizable matrix of coal pitch (2:20-21) which is submitted to be thermoplastic;

Heating the mixture to a sufficient temperature to melt at least a portion of the matrix material (2:19-21);

While heating the mixture, applying a pressure of at least 35 kg/cm<sup>2</sup> to the mixture to form a compressed composite material.

Sodha is silent to (a) the friction additive and (b) applying an electric current to the mixture to generate heat within the mixture.

However, Kalnins teaches (a) using a friction additive (4:48) and (b) applying an electric current to the mixture to generate heat within the mixture (3:60-4:3 and column 2).

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Kalnins into that of Sodha because (a) Sodha's method is to be used for making brakes (1:13) and the friction modifier of Kalnins would increase the lifetime of the article or adjust its friction, producing desirable brakes, and (b) the method of Kalnins ensures uniform heating (1:30-34) which would be desirable in producing brakes in order to produce articles having uniform shapes and mechanical properties. **As to**



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**Claims 2-4**, Kalnins teaches at least silica (4:45-48). **As to Claim 7**, Sodha specifically teaches a hot pressing temperature of 700 C (5:13), and it is noted that Sodha provides the process conditions of Claim 1, namely the pitch, carbon fibers, and compression pressure. Thus it is submitted that by providing all the process variables, fabrication of the claimed density would be implicit. Although Sodha is silent to the thirty minutes, it is submitted that this recitation is not limiting because it does not recite that the heating time is 30 minutes, but only that a compressed material having the claimed density is formed within thirty minutes. Thus, by providing the claimed process conditions, the method of Sodha would have formed a compressed composite material within thirty minutes as claimed. **As to Claim 8**, Sodha teaches pitch and PAN carbon fibers (2:27-30, 6:64). **As to Claim 10**, Sodha teaches that a ramping temperature may be used (5:19-25, for example), and in ramping from low temperature to high temperature using the method of Kalnins it would be implicit to use a first power level and then to increase the power level to reach the next temperature. **As to Claim 11**, Sodha teaches the claimed range of carbon fibers and carbonizable material (3:22-28). Kalnins teaches that the friction modifier can be used at a percentage between 3-30% (4:35-5:5). **As to Claim 12**, Sodha teaches increasing the density by introducing a carbonizable material into the voids and baking to achieve the claimed density (6:27-37). **As to Claim 19**, Sodha teaches a method of forming a composite material suitable for brakes comprising:

- (a) compressing a mixture of carbon fibers and coal pitch (2:20) which is implicitly thermoplastic;
- (b) heating to a temperature of at least 500 C to form a compressed preform (3:31);

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(c) introducing a carbonizable material into the compressed preform to form an impregnated preform (4:4-6, 6:3-6);

(d) baking to carbonize (6:5-10)

(e) repeating impregnation (7:18-20)

(f) graphitizing (Abstract) at a temperature of at least 1500 C (4:33, 3:29-33) to form a graphitized preform having a density of at least about  $1.7 \text{ g/cm}^3$  (5:25-27, 6:36).

Sodha is silent to (a) the friction additive and (b) applying an electric current to the mixture to generate heat within the mixture.

However, Kalnins teaches (a) using a friction additive (4:48) and (b) applying an electric current to the mixture during the step of compressing to generate heat within the mixture (3:60-4:3 and column 2).

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Kalnins into that of Sodha because (a) Sodha's method is to be used for making brakes (1:13) and the friction modifier of Kalnins would increase the lifetime of the article or adjust its friction, producing desirable brakes, and (b) the method of Kalnins ensures uniform heating (1:30-34) which would be desirable in producing brakes in order to produce articles having uniform shapes and mechanical properties.

10. **Claims 5 and 6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sodha (USPN 5057254) in view of Kalnins (USPN 4252513), and further in view of Heitman (USPN 3254143) and Ho (USPN 5037626). Sodha and Kalnins teach the subject matter of Claim 2 above under 35 USC 103(a). **As to Claim 5**, Sodha and Kalnins are silent to converting the

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disclosed oxide (silica) to a carbide by heat treating the compressed composite material at an elevated sufficient temperature. However, Heitman teaches that it is known to combine oxides such as silica (7:30-75) with a pitch binder (4:27-34) for the purpose of converting to carbides (7:30-71). Ho provides motivation for one of ordinary skill in the art to make the combination because silicon carbide is a high strength material having good chemical stability, excellent oxidation resistance, and because the mixture of a carbonizable matrix and silica (2:10-28) can induce a reaction which produces a relatively large proportion of silicon carbide whiskers (2:24-28), which are a much more effective reinforcement in composites than particulates (1:18-20), which would be desirable in the method of Sodha. **As to Claim 6**, Sodha teaches that a pitch primary formed product (5:63-6:1) may be impregnated with carbonizable material (6:3-5).

11. **Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable over Sodha (USPN 5523035) in view of Kalnins (USPN 4252513) and further in view of Hatch (USPN 4166145). Sodha and Kalnins teach the subject matter of Claim 1 above under 35 USC 103(a). This alternative rejection is set forth to address the interpretation of Claim 7 where thirty minutes is interpreted to be a required variable of the process. **As to Claim 7**, Sodha specifically teaches a hot pressing temperature of 700 C (5:13), and it is noted that Sodha provides the process conditions of Claim 1, namely the pitch, carbon fibers, and compression pressure. Thus it is submitted that by providing all the process variables, fabrication of the claimed density would be implicit. Sodha is silent to the claimed thirty minutes. However, Hatch clearly teaches that temperature ramp and time clearly represent result effective variables (5:16-19, 6:12-17, 6:23-37). In view of Hatch's teachings, one of ordinary skill would have found it prima facie obvious

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to optimize the heating time. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Hatch into that of Sodha because Sodha suggests fabrication of brakes (1:13) and Hatch teaches the process variables as suitable for brakes (1:20), and because doing so would produce a dense composite having desirable properties including high temperature oxidation resistance (1:15-17).

12. **Claim 9** is rejected under 35 U.S.C. 103(a) as being unpatentable over Sodha (USPN 5523035) in view of Kalnins (USPN 4252513) and further in view of Klett (USPN 5744075). Sodha and Kalnins teach the subject matter of Claim 1 above under 35 USC 103(a). **As to Claim 9**, Sodha is silent to powdered pitch. However, Klett teaches powdered pitch (4:59-65) and polyacrylonitrile carbon fibers (4:59-65). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Klett into Sodha because Klett provides a desirable composition for brakes (2:5), the product of Sodha (1:13) and because Klett's method provides would help evenly distribute the binder material.

### ***Response to Arguments***

13. Applicant's arguments filed 20 April 2007 have been fully considered. The arguments appear to be on the following grounds:

- a) Huang is not proper prior art.
- b) The invention requires a thermoplastic pitch and friction additive.

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14. These arguments are not persuasive or moot for the following reasons:

- a) This argument is not persuasive. The declaration (1) does not include all inventors of the subject matter claimed or state that less than all named inventors invented the subject matter of Claims 1 and 19, (2) does not state that the invention was conceived and reduced to practice prior to the effective date of the reference, and (3) does not state that the showing of facts and evidence relied upon is from a date prior to the date of the effective reference.
- b) This argument is moot in view of the new rejection set forth above. The coal or petroleum pitches of Sodha having a softening point of 100 to 400 C (2:19-23).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Daniels whose telephone number is (571) 272-2450. The examiner can normally be reached on Monday - Friday, 8:00 am - 4:30 pm.

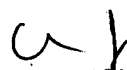
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on (571) 272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MJD 6/20/07

MJD

  
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SUPERVISORY PATENT EXAMINER  
6/22/07